

REMARKS

I. STATUS OF THE CLAIMS

In accordance with the foregoing, claims 1, 9, 10, 11, 16 and 17 have been amended. Claims 18-20 have been newly added and are similar to claims 1-2 and 10 respectively. No new matter is presented. Accordingly, claims 1-20 are pending and under consideration.

II. THE REJECTION OF CLAIM 9 UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claim 9 has been amended to correct the minor informality indicated by the Examiner. Accordingly, Applicants respectfully request that the rejection of claim 9, under 35 U.S.C. §112, second paragraph be withdrawn.

III. THE REJECTION OF CLAIMS 1-3 AND 8-10 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA IN VIEW OF SWANSON AND SATOH

Independent claim 1, as amended, recites amongst other novel elements "a **setting** of said **pre-emphasis** in said pre-emphasis performing means is made **after** controlling a setting of an  $\alpha$  **parameter** representing an amount of the optical wavelength chirp in said chirp applying means."

Independent claim 10, as amended, recites amongst other novel elements "wherein the **setting** of said **pre-emphasis** is made **after** controlling the setting of the  $\alpha$  **parameter** representing an amount of the optical wavelength chirp."

Accordingly, independent claims 1 and 10 recite setting the pre-emphasis after the  $\alpha$  parameter. If the setting sequence is made opposite to the one recited in amended claims 1 and 10, that is setting the pre-emphasis and then setting the  $\alpha$  parameter, the setting of the pre-emphasis may be controlled with each waveform of each channel not being optimized. As a result, extremely high power may be required at only a particular channel. In this case, due to the waveform degradation caused by the non-linear effect, it may not be able to reach a predetermined BER even if subsequent control of the setting of the  $\alpha$  parameter is made.

Accordingly, by setting the pre-emphasis after the  $\alpha$  parameter, as recited in independent claims 1 and 10, it's possible to obtain optimized transmission characteristics by making the control in such a sequence that at first, an optimizing point of waveform is obtained by controlling

the section of the  $\alpha$  parameter, and then the noise over the signal waveform is equalized for each wavelength by the pre-emphasis.

Terahara discloses an apparatus and method for controlling power levels of individual signal lights of a wavelength division multiplexed (WDM) signal light (abstract).

Swanson discloses a data transmission apparatus having first and second optical transmitters coupled to an optical link. A forward error correction (FEC) coder is coupled to the input of the second optical transmitter (abstract).

Satoh discloses an optical transmitter including a light source emitting input light, and a modulator modulating the input light in accordance with an input electric signal to generate an optical (abstract).

Therefore, neither Terahara nor Swanson nor Satoh, whether taken singly or combined teach or suggest setting the pre-emphasis after setting the  $\alpha$  parameter, as recited in newly amended independent claims 1 and 10.

Accordingly, Applicants respectfully submit that the rejection of independent claims 1 and 10 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh, whether taken singly or combined teach or suggest each feature of independent claims 1 and 10, as amended.

Furthermore, Applicants respectfully assert that dependent claims 2, 3, 8 and 9 are allowable at least because of their dependence from claim 1, and the reasons set forth above.

#### IV. THE REJECTION OF CLAIM 4 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND FURTHER IN VIEW OF TAGA

Claim 4 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh, whether taken singly or combined teach or suggest the features recited in newly amended independent claim 1.

Taga discloses a wavelength division multiplexed (WDM) optical communication method and apparatus using a pre-emphasis technique to adjust the attenuation or amplification of a particular optical channel at a transmitter terminal to produce identical signal-to-noise ratios for all of the optical channels at a receiver terminal (abstract).

Accordingly, Taga also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 4 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Taga, whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 4 depends from.

V. THE REJECTION OF CLAIM 5 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND FURHTER IN VIEW OF KHALEGHI

Claim 5 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh, whether taken singly or combined teach or suggest the features recited in newly amended independent claim 1.

Khaleghi discloses a method and apparatus for channel performance equalization in wavelength division multiplexed (WDM) systems, where performance of the channels is estimated from optical power measurements of each signal transmitted by the channels (abstract).

Accordingly, Khaleghi also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 5 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Khaleghi, whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 5 depends from.

VI. THE REJECTION OF CLAIM 6 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND FURHTER IN VIEW OF EGGLETON

Claim 6 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh, whether taken singly or combined teach or suggest the features recited in newly amended independent claim 1.

Eggleton discloses an optical communication system having one or more automatic dispersion compensation modules, each module having an adjustable dispersion element, a data integrity monitor and a feedback network whereby the monitor adjust the dispersion element to optimize system performance (abstract).

Accordingly, Eggleton also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 6 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Eggleton, whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 6 depends from.

VII. THE REJECTION OF CLAIM 7 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH, EGGLETON AND FURTHER IN VIEW OF BULOW

Claim 7 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh, whether taken singly or combined teach or suggest the features recited in newly amended independent claim 1.

Bulow discloses an electrical equalizing facility for an electric input signal derived from an optical signal transmitted over an optical fiber which is distorted due to interference in the optical signal as a result of polarization (abstract).

Accordingly, Bulow also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 6 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Bulow, whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 7 depends from.

VIII. THE REJECTION OF CLAIMS 11-14 AND 16 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA IN VIEW OF SWANSON, FORD AND STEPHENS

Independent claim 11 recites, amongst other novel features, "said control means of said transmitting terminal station and said Raman amplification control means of said optical repeater station control the **setting of pre-emphasis** in said pre-emphasis performing means **after controlling** the supply **condition of Raman excitation light** in said Raman amplifier."

Accordingly, claim 11 recites setting the pre-emphasis after controlling the supply condition of

Raman excitation light.

Independent claim 16 recites, amongst other novel features, "in said optical repeater station, depending on the reception information about each wavelength transmitted from said transmitting terminal station, a supply condition of Raman excitation light for Raman amplifying the wavelength division multiplexed signal light transmitted through said optical transmission path is controlled, and in said transmitting terminal station, depending on the reception information about each wavelength transmitted from said receiving terminal station, a setting of pre-emphasis to be performed on the wavelength division multiplexed signal light transmitted through said optical transmission path is controlled."

Equalization of the OSNR and the BER by adjusting an excitation light of a Raman amplifier is made for a block of wavelengths, and therefore, the OSNR and BER for each wavelength cannot be equalized. As recited in claim 11, the pre-emphasis is set after controlling the excitation light. Therefore, it is possible to obtain optimized transmission characteristics by making the control in such a sequence that at first a tilt-shaped waveform is obtained for the OSNR optimized as the entire wavelength by adjusting the excitation light of the Raman amplifier so that the load on the pre-emphasis is reduced, and the OSNR's or BERs of all the wavelengths are equalized by the control of the setting of the pre-emphasis.

Neither Terahara, nor Swanson, nor Ford nor Stephens disclose setting the pre-emphasis after controlling the supply condition of Raman excitation light, as recited in newly amended independent claim 11 nor controlling a supply condition of Raman excitation light for Raman amplifying the wavelength division multiplexed signal light and controlling pre-emphasis setting to be performed on the wavelength division multiplexed signal light, as recited in newly amended independent 16.

Accordingly, Applicants respectfully submit that the rejection of independent claims 11 and 16 under 35 U.S.C. §103(a) be withdrawn because neither Terahara nor Swanson nor Ford, nor Stephens whether taken singly or combined teach or suggest each feature of independent claims 11 and 16, as amended.

Furthermore, Applicants respectfully assert that dependent claims 12-14 are allowable at least because of their dependence from claim 11, and the reasons set forth above.

IX. THE REJECTION OF CLAIM 17 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA IN VIEW OF SWANSON, SATOH AND

STEPHENS

Independent claim 17 recites, amongst other novel features, "wherein a **setting** of the **pre-emphasis** in said pre-emphasis performing means is **after** controlling a **setting** of an  $\alpha$  **parameter** representing an amount of the optical wavelength chirp in said chirp applying means."

As noted above, neither Terahara, nor Swanson, nor Satoh nor Stephens teach or suggest setting the pre-emphasis after setting of an  $\alpha$  parameter, as recited in newly amended independent claim 17.

Accordingly, Applicants respectfully submit that the rejection of independent claim 17 under 35 U.S.C. §103(a) be withdrawn because neither Terahara nor Swanson nor Satoh, nor Stephens whether taken singly or combined teach or suggest each feature of independent claim 17, as amended.

X. CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: May 24, 2004

By: *Douglas X. Rodriguez*  
Douglas X. Rodriguez  
Registration No. 47,269

1201 New York Avenue, NW, Suite 700  
Washington, D.C. 20005  
Telephone: (202) 434-1500  
Facsimile: (202) 434-1501